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Thinning Plantations.

IN "Observations on the Treatment of Public Plantations; More Especially Relating to the Use of the Axe," by F. L. Olmsted and J. B. Harrison, we have a more direct and explicit discussion of the evil of overcrowding trees in parks and public grounds, and of the necessity of proper thinning than has before been presented in this country in popular form. The Report is addressed to Mr. Killian Van Rensselaer, as it was prepared at his suggestion, in behalf of the West End Improvement Association, the Torrey Botanical Club, the Park Commissioners of New York and others interested. It had its origin in the popular outcry which arose in this city last winter in protest against thinning the trees in Central Park. Mr. Olmsted was one of the designers of the park, and he has had as much both of culture and experience in landscape-art as any member of his profession, and his judgment in all that pertains to the use of trees and their relations to each other, in parks and public grounds, is probably not surpassed by that of any living artist. The Report sets forth precisely what any man, possessing the technical knowledge, which is the only possible basis for an intelligent judgment of the matter, would be compelled to say under the circumstances.

One of the most serious hindrances to progress and success in the management of public parks in this country has, for many years, been the fact that a public sentiment has been cultivated, the effect of which, in numerous instances, has been to keep trees standing that should have been cut out, and, in a general way, as this Report observes, "to prevent the free exercise of any specially competent judgment upon the question of thinning public plantations." The popular feeling on the subject is natural and, at present, inevitable. It is only a special form or development of the general conviction that in this country men are competent to decide almost any question without special training or preparation. There has been, hitherto, little respect in America for technical knowledge, except in connection with the industrial and money-making arts, and the popular mind is still inclined to reject the idea of its necessity. But the changes in the conditions of life here during the last twenty-five years have rendered it far more necessary than it was before. The need of special training in the management of public parks increases steadily, just as the requirement for technical knowledge in the other pursuits of civilized life is made more imperative by the increasing variety, complexity and costliness of modern ways of living.

The people of an entire community, or its principal citizens, may be possessed of a high degree of general intelligence, and may have much special culture of various kinds, without the special equipment or training which would enable them to determine whether the trees in a park have been properly thinned and developed or not. Their judgment regarding the question of cutting out particular trees is probably not more apt to be right than their judgment of the special medical treatment required in a case of pneumonia or yellow fever. But it will be a long time before this truth will be generally recognized and understood, and the work of the few men who have any special knowledge of matters pertaining to park management will often be thwarted by vexatious interference, or defeated altogether by attacks inspired by untrained and erroneous opinion. The development of a higher degree of special knowledge in the public mind is necessarily a slow work, as is also such an advance in civilization and general attainment as will enable our people to recognize the necessity for special training wherever it is required, and will also incline them to leave to men who possess adequate training and equipment the decision of whatever belongs to their special art or department of knowledge.

If this Report could be carefully considered by the most intelligent men and women of our principal cities it would help to prepare the way for an advance in the methods of park management in the matter with which it deals, but the entire discussion will have to be repeated again and again, with varying special illustrations as new cases of difficulty and error arise from time to time. Most communities are impatient for immediate effect in tree-planting, and trees are put in at first which every competent landscape-artist knows should be removed in a few years. But when the time for their removal has come, no one is likely to recognize its necessity unless he is qualified to judge of the matter by the special training and technical knowledge of a competent landscape-artist.

The Report is enriched by a great number of quotations from the leading writers of this country and Europe, bearing directly and most pertinently upon the question discussed. The authors conclude, after a very thorough examination of the park, that the tree-cutting, of which complaint was made, was not excessive, but that additional removals should be made, especially of trees which were not originally intended to remain permanently, and this conclusion is undoubtedly correct.

The manufacture of Red Cedar pencil-wood has for years been almost exclusively confined to Florida, where this tree grows to a large size and in great perfection. The business has been in the hands of a large foreign house, which supplies a good part of the world with lead pencils, and has been profitable. Large Cedar timber, straight grained, and of a suitable quality for pencil-stuff has become scarce in Florida along the streams on the west coast, where the best was found; and factories are springing up in different parts of the south, especially in Alabama, where, at Gurley, sawing pencil-stuff is already a considerable industry. The best Red Cedar, however, now left will be found near the Red River, in Texas, and in the Indian Territory, where this tree attains a greater size than it reaches in Florida, while the quality of the lumber is not, probably, in any way inferior.

The world has become so accustomed to using pencils made of red cedar that it will not readily adapt itself to any others. The supply of this lumber of suitable quality,

however, is not large in proportion to the demand, and cannot hold out many years longer.

The Red Cedar is the most widely distributed of North American conifers, and in some parts of the country it is one of the most common trees; but it is in a few favored localities only that it grows in a way to produce the straight-grained material essential for pencil-making.

The distillation of oil of Cedar, for which there is now a large commercial demand, from the sawdust and other refuse, has been profitable in the pencil-mills at Cedar Keys in Florida, and might be carried on to advantage in other parts of the country. It can be made, of course, from wood of the poorest quality.

Topiary Gardening in Japan.

WE have published, in recent issues of this journal (vol. ii., pp. 103, 211), good examples of topiary gardening as practiced in New England and in Old England, while the illustration upon page 307 of the present issue represents a garden in Tokio, in which the chief features are clipped Pines. They are specimens of *Pinus densiflora*, the species most often used by the Japanese for this purpose. An examination of these three pictures will show that the Japanese are not behind the Americans or the English in mechanical skill in reducing their trees to formal shapes, or in artistic skill in grouping them, so as to bring out the beauties of purely formal gardening.

We are indebted to Mr. James M. Codman for the photograph from which our illustration has been made.

Notes on the Production of Maple Sugar.

ONE of the most important and interesting of the early writings on the Sugar Maple is "An Account of the Sugar Maple-tree of the United States," by Dr. Benjamin Rush. It was written in the form of a letter to Thomas Jefferson, was read before the American Philosophical Society and published in the "Transactions" of the Society in 1792. Some of the statements hold good at this time, but others sound oddly when compared with modern knowledge and practice. Dr. Rush had a very high opinion of the merits and value of the Sugar Maple. He says: "Its small branches are so much impregnated with sugar as to afford support to the cattle, horses and sheep of the first settlers during the winter, before they are able to cultivate forage for that purpose. . . . The tree is supposed to arrive at its full growth in the woods in twenty years. . . . It is in consequence of the sap of these trees being equally diffused through every part of them, that they live three years after they are *girdled*—that is, after a circular incision is made through the bark into the substance of the tree for the purpose of destroying it." We are told that there are three methods of reducing the sap to sugar: "By freezing it," "by spontaneous evaporation" and "by boiling." After giving some figures to show that more sugar might be made from the Maple in the country than would be necessary for home consumption, Dr. Rush, in speaking of the benefits he expects from its general use, says: "They will, I hope, extend themselves to the interests of humanity in the West Indies. With this view of the subject of this letter, I cannot help contemplating a Sugar Maple-tree with a species of affection and even veneration, for I have persuaded myself to behold in it the happy means of rendering the commerce and slavery of our African brethren in the sugar islands as unnecessary, as it has always been inhuman and unjust." In a foot-note we are told that "Mr. Jefferson uses no other sugar in his family than that which is obtained from the Sugar Maple-tree. He has lately planted an orchard of Maple-trees on his farm in Virginia."

Since Dr. Rush wrote his paper much progress has been made in the production and manufacture of syrup and sugar from the Maple, although it has not received so much attention as has fruit-growing and some other kindred industries. It is a most important source of income on many of our northern farms, and the sugar-orchard, or "sugar-bush," as it is often called, is in many districts coming to be as well looked after and cared for as a vineyard or fruit-orchard. The annual profit is probably larger than the average of farm crops occupying the same acreage of ground, and the work is done before the ordinary farm labors have begun. In many well-managed sugar-orchards the dead and diseased branches are carefully pruned off, and the wounds covered by some protecting substance to prevent injuries by insects or fungus diseases.

Some of the more thrifty proprietors, at the end of the sap-harvest, have the holes which were bored in the trees carefully plugged with neat stoppers of dry, sound wood, cut so as not to project beyond the surface of the last ring of wood formed. At the close of the growing season the new layer of wood and bark will have completely covered the wound. This is a great improvement on the barbarous method of making a great gash in the side of the tree with an axe and using a chip for a spout. The amount of abuse which a large tree will bear when standing in the forest is surprising. In some districts there are many large old trees to be found having the trunks for five or six feet from the ground, very rough and uneven, and often a foot greater in diameter than the trunk immediately above, caused by the earlier crude way of obtaining the sap. These trees may have been subjected to such rude treatment almost every year for half a century or more, and now, tapped in the more approved way, they continue to produce abundantly without showing other signs of injury or decay than such as are found in trees under natural conditions as they attain old age.

In regard to the manner of tapping the trees writers still seem to differ in their accounts as to the depths bored. Dr. Rush, in the essay already quoted, says: "The perforation is made with an axe or an auger. The latter is preferred from experience of its advantages. The auger is introduced about three-quarters of an inch, and in an ascending direction, and is afterwards deepened gradually to the extent of two inches."

In Emerson's "Trees and Shrubs of Massachusetts" (p. 564) it is stated that the holes are bored "to the depth of from two to six inches, according to the size of the tree, and M. Ed. André, in an article in the *Revue Horticole* for 1886, p. 284, says that the holes are often bored even to the heart of the tree. There are probably very few experienced men, owning sugar-orchards now, who have the holes bored more than a couple of inches in depth, and one inch is deemed quite sufficient by many. There is little to be gained, and a much greater possibility of injury to the tree by boring deeply into its trunk. Probably nearly all of the sugar-bearing sap comes from the outer layer of wood extending less than an inch deep. Many writers have stated that the south side of the tree gave the best flow of sap, but experienced men advise tapping the side bearing the most branches.

As yet most of the sugar-orchards are made up of trees of natural growth, and comparatively few plantations have been set out for sugar-making purposes. The twenty-five years required by the trees to grow before being regularly tapped seems a long period to many, but if properly planted with other trees among them the Maple-orchard could be made self-supporting, by annual thinning of wood, after the first few years. Trees on rocky hill-sides yield more profitable sap than those on low ground, so that some of the best locations would be on New England hill-sides that are now bare and unprofitable. The French Canadians in some portions of Canada are said to be planting large quantities of the Ash-leaved Maple (*Negundo aceroides*), with the idea of producing syrup and sugar from it, and because it is a fast-growing tree.

The time may not be far distant when nurserymen will give particular attention to the propagation of the best sugar-producing strains of Maples and other native trees. Careful comparative studies of the amount of sap obtained from different species of trees, and of the same species under different conditions, and of the percentages of sugar contained in the sap are much needed. Numerous analyses have been made of saps by different investigators, but the published results are very contradictory and unsatisfactory. While, no doubt, much depends upon the surroundings, vigor and other conditions attending the trees, it seems as if some general rules might be determined upon which would be approximately reliable. Dr. G. L. Goodale gives the average amount of sugar in the sap of *Acer saccharinum* as about eight per cent. (Physiological Botany, p. 360), which seems very high when compared with the results of other experiments. In the report of the Massachusetts Board of Agriculture, 1874-75 (p. 290) the analysis by Charles Wellington gave a result of 2.777 per cent.

In recording some interesting experiments made in Indiana (Proceedings A. A. A. S., 1879, vol. xxvii., p. 234) Dr. H. W. Wiley gives the highest percentage as 4.30, from a tree noted for the sweetness of its sap. In a series of experiments conducted at Lunenburg, Vermont, under the direction of Dr. Wiley, and published in Bulletin No. 5 (1885) of the Chemical Division of the Department of Agriculture, the highest percentage recorded was 10.20 in a small flow of sap from a speci-

men of Sugar Maple during one of the last days of the flow, the average being 5.01 per cent., and 9.88 per cent. was obtained from a similar flow of sap from an isolated White Maple (*Acer dasycarpum*), which averaged 4.36 per cent. of sugar during the season. The average of all the analyses from all the trees experimented upon is considerably less than 4 per cent. of sugar.

In making some experiments on the sap of the Ash-leaved Maple (*Negundo aceroides*), Dr. B. J. Harrington, of McGill College, Montreal, found in a series of careful experiments that the average amount of sugar in the sap of these trees was very nearly 2.50 per cent. In a slight test of the sap from a tree of *Acer saccharinum* on the college grounds he found a little over 5 per cent. of sugar. The detailed account of the experiments with the Negundo sap is published in the "Transactions of the Royal Society of Canada," vol. v., sect. iii., 1887.

Adulterations and imitations of both sugar and syrup are very common. An extract obtained from the bark of Hickory (*Carya*) is said to resemble the Maple flavor very closely when mixed with cane syrups. Such imitations may tend to lower the price of the pure product a little, but there will always be a demand for the true article. It is not likely that Maple will take the place of cane-sugar, as Dr. Rush hoped, but the consumption and perfection of production will continue to advance.

Arnold Arboretum. *J. G. Jack.*

Foreign Correspondence.

London Letter.

NEVER were the florists of London so busy as they now are, at the very height of the season. Every day they must provide sumptuous and extravagant feasts of flowers at the houses of the great, where flowers seem to be more highly appreciated than ever. Those who are not behind the scenes wonder where the material comes from to supply the London fashionable world, and to many such an opportunity was afforded the other night to see for themselves the inner life of our great flower-market at Covent Garden. The market-growers and florists have interested themselves in a most commendable way on behalf of a charity established last year as the Gardeners' Orphan Fund, and in order to augment the funds they organized a public fête or show of their own productions, such as they send every day throughout the year to our central flower-emporium. The flower feast, for such it was, was greatly appreciated by thousands who never before saw a wholesale flower-market, and not a few seemed astonished at the gorgeous sight. The perfection to which popular plants are grown for sale astonished even professional gardeners, who have to grow miscellaneous collections of plants, whereas most of the great market-growers devote their sole attention to a few classes of plants, the result being that they bring the plants to absolute perfection.

The great flower-market at Covent Garden is truly a gorgeous sight, though there is necessarily a good deal of sameness among the plants exhibited. The flowers of the season were, of course, in strongest force, for the show was just on the eve of "bedding out" week, when millions of plants come through the market to be dispersed throughout the suburbs. Among the most prominent kinds of plants were Pelargoniums of all kinds, but especially the old Scarlet Vesuvius. It is surprising to see how comparatively few sorts are grown for the market, and it is equally remarkable how very few among the infinite variety of Pelargonium are able to conform to the market-growers idea of a standard sort. Forced Roses were plentiful, especially the delicate Tea-scented sorts, which seem to take with the public more than the high colored kinds, and this is, I fancy, on account of their perfume. Niphetos is the leading sort with all the growers. Stand after stand was filled with nothing but double Poet's Narcissus, which, for the time, quite usurps the proud position the Gardenia holds for the adornment of the coat. The florists have a clever way of making this Narcissus look so like a Gardenia that it puzzles one to detect the fraud. They "dress" the petals—that is, they extract the small ones, flatten the big ones and surround the bloom with a few leaves of the green Japanese Euonymus, whose shining foliage passes well for that of Gardenia.

Irises of all varieties of the Japonica group are coming into public favor more and more, especially now that a famous grower at Twickenham has turned his attention to them and has planted the best sorts by the acre. But the Iris is not everybody's flower, and only those who have the gift of artistically arranging flowers can make the Iris look as it should in a vase. The sorts most in demand are the dark purples and clear yellows and whites. Marguerites are as popular as ever, and their culture is so remunerative that some of the smaller growers produce very little beside them. They were here to be seen of all sizes in pots, from plants a yard through to the tiny bits in thumb-pots for bedding out. The yellow sorts, such as Compte de Chambord and Etoile d'or, seem to be more difficult to grow than the white, as they were not nearly so fine. Among other popular flowers were Fuchsias, Violets and Pansies, Stocks, Petunias, Lilies of the Valley, Tulips, Scillas, Heaths, Spiræas and Miss Joliffe Carnations, which sort is undoubtedly the best for the market. The pyramidal Saxifrage (*S. Cotyledon*, var. *pyramidalis*) is now largely grown, and a group of a hundred plants, all with tall clusters of small white flowers, was one of the prettiest things I saw.

Orchids, singularly enough, were not plentiful, though there was evidence that these fashionable but expensive flowers are becoming more in demand as market flowers. The chief lots of cut blooms were of the Alexandrian Odontoglossum, which for wreaths, sprays and the like, are matchless. Cattleyas, Lælias, and other showy common kinds, were represented by a few flowers, but it is apparent that this Orchid does not find favor with the great growers yet. There was nothing very remarkable among the foliage plants, which, though not so plentiful as the flowers, were to be seen by the thousand. The plants with highly-colored leaves, such as Coleus, Caladiums, Dracænas, Crotons and the like, seem to be regaining their former popularity, and I am told by the great London nurserymen that fine foliage plants are likely to be as much in demand as they were a dozen years ago, when bright-leaved plants were as popular, almost, as Orchids are now. *W. Goldring.*

New or Little Known Plants.

A Hybrid Catalpa.

THE name *Catalpa × J. C. Teas*,* is suggested for a plant whose hybrid origin is probable. The history of the plant is, briefly, this: J. C. Teas of Carthage, Missouri, while living in Indiana, in 1864, purchased a seedling Catalpa from Mahlon Moon of Morrisville, Pennsylvania, who had raised it from seed procured from Japan by Hovey & Co., the Boston seedsmen. According to the statement of Mr. Teas, to whom I am indebted for the facts in the case, this tree, which proved to be *C. Kæmpferi*, was planted in his nursery among or near plants of *C. bignonioides* and *C. speciosa*, the two North American species; and it produced in due time one pod of seeds which were quite unlike those of any Catalpa with which Mr. Teas was acquainted. The seeds were planted and gave rise to a tree almost intermediate in character between *C. Kæmpferi* and one of the American species. The appearance of this seedling tree and its progeny suggests that the pollen from a flower of one of the American Catalpas had fertilized a flower of the Japanese tree. The American parent was probably *C. bignonioides*, although Mr. Teas is inclined to believe that it was *C. speciosa*. The latter flowers two or three weeks earlier than the Japanese species, whereas the former flowers contemporaneously with that species during the first week of July.

Whatever may have been its origin, the hybrid of which a figure appears upon page 305 is an erect, vigorous, and rapid-growing tree, with the thin, scaly bark of the American species. The leaves are sharply three-lobed, or rarely entire, and more or less cordate at the base; they are slightly pubescent on the lower surface, and the mid-rib and primary veins are covered with scattered hairs; they are twelve to fifteen inches long and ten to twelve inches broad. The inflorescence, which is eighteen to twenty inches long by ten inches wide, is composed of two or three hundred fragrant flowers about an inch long, the corolla slightly tinged with yellow in the throat, and handsomely marked with broad purple stripes. The fruit is from twelve

*Catalpa, J. C. Teas; nov. hyb. Arbor excelsa, ramis horizontalibus; foliis amplis, longe petiolatis, ovatis acuminatis, basi rotundatis vel cordatis, integris vel sæpissime 3-5 lobis, lobo medio attenuato-acuminato, lateralibus brevibus divergentibus, subtus villoso-hirsutis; paniculis terminalibus amplis, floribus gracile pedicillatis, calycis labiis rotundatis mucronatisque, corollæ tubo campanulato, limbi 2-labiati, lobis 5, rotundatis, flavis vel albidis lanthino punctatis; capsula cylindracea seminibus alatis molliter villosis utrinque in caudas capilliaceo-fissas productis.

to fifteen inches in length and not more than a quarter of an inch thick in the middle. The wings of the seed are half an inch in length and one-eighth of an inch in width, and like the others of the genus are tufted with long white hairs.

The leaves of this tree are much larger than those of either of its parents, having when they first appear the velvety character and the purple color peculiar to those of the Japanese plant, and the reddish spot at the insertion of the petiole with the leaf-blade which characterizes that species. They more generally resemble those of the Japanese species in shape, color and texture, while the pubescence which covers the lower surface is almost intermediate in character between those of the American and of the Japanese species. The inflorescence is much larger than that of the American or of the Japanese plants, being fully twice as large as that of *C. bignonioides*, and more than three times the size of *C. Kæmpferi*. The flowers are intermediate in size; in color and in markings they most resemble those of the American species, although a tinge of yellow in the throat of the corolla points to their Japanese descent. The fruit of the hybrid is almost intermediate in size between those of the two parents, as are the seeds, which are perfectly fertile and often reproduce the original form in every particular. When, however, seedlings show a tendency to vary from the original form the variation is generally in the direction of the Japanese rather than of the American parent.

The hybrid is a more vigorous tree than either of the American or the Japanese species, and it grows rather more rapidly. It is too soon to speak of its value as a timber-tree, as the largest specimens in the western states, where this tree has been much more generally planted than at the east, are, according to Mr. Teas, only forty to fifty feet high, with trunks which do not exceed yet a diameter of eighteen inches. Of its value as an ornamental tree there can be no doubt. Its larger size and more rapid growth, its better habit and more showy inflorescence make it a far more valuable ornamental tree than the Japanese species; it is more hardy than either of the North American species, and although the flowers are smaller, the panicles and the number of individual flowers are much larger.

The best forms, from an ornamental point of view, are those in which the flower most nearly approaches those of the American species in size and color; and, as the seedlings show a decided tendency to revert, so far as the flower is concerned, to the Japanese parent, it will be necessary to perpetuate selected varieties by grafting. The great vigor of the seedlings of the hybrid will, no doubt, make these the best stocks for this purpose. Among a number of these seedlings sent to the Arnold Arboretum by Mr. Teas there is one in which the corolla is doubled.

If it is true that the plant is a hybrid, and there seems no good reason for doubting that it is, this tree illustrates in a remarkable manner the advantage in vigor and hardiness which the progeny resulting from the crossing of two species may obtain over either of its parents. The fact is doubly interesting, moreover, because hybrid trees, whose origin is known with as much certainty even as that of this Catalpa, are rare. Some fruit-trees are doubtless derived from crosses of nearly allied species or distinct forms of a widely-distributed species. Oaks, Walnuts and Willows, which are believed to be hybrids between related species are not uncommon, and it has been suggested that some of the varieties of Cinchona which produce the most valuable bark may be hybrids. The origin of such plants, however, is always veiled in doubt, and I do not at this moment recall any other hybrid tree, with the exception of *Magnolia Soulangeana* and the other hybrids between *M. conspicua* and *M. obovata*, whose history is as little doubtful as is that of this Catalpa, which seems destined, whatever its economic value may be, to become a valuable ornament in the decoration of parks and gardens.

C. S. S.

Cultural Department.

Forcing the Gladiolus.

THE Gladiolus, when grown as a forced flower, is appreciated to a greater extent than when grown out-of-doors. Like many other flowers, it is better under the protection of glass when well cared for, as the flowers are larger, the colors purer and the spikes longer. To force the Gladiolus successfully, however, requires attention at just the right time, and its wants should always be anticipated and supplied. Here is the routine of my practice: The bulbs I forced this year were also forced last year. They were then planted February 8th, and the first twenty-five flowers were cut May 30th. This year's work began December 27th by potting each bulb in a four-inch pot, using sandy loam, without manure, and placing the bulb on the top, pressing it down to hold it without any other covering; they were watered and then placed underneath the benches of a Carnation-house until the beginning of February. At that time those plants which had grown to the height of four inches were brought to the light and again watered. Placing them close together on a bench near the light, a little water was given from time to time, retarding the top growth, and encouraging root-action as much as possible. By the 20th of the month the plants were gone over, and all those of an even size were planted together in rows about a foot apart and nine inches apart in the rows. After planting those of one size, then another batch a size less was handled. This selecting into sizes pays for all the trouble it costs in preventing strong plants from overcrowding the weaker ones. My soil is rather a heavy sandy loam, and in this the Gladioli were planted, the depth of the entire bed being a little more than four inches. The bulbs were scarcely covered even at this time, and this, I find, prevents the damping off of the plants during dull days, when they have commenced to grow rapidly, and are checked either by dark weather or by a cold spell. By the middle of March each plant was tied securely to prevent its falling over, which is generally ruinous to the flower-spike; a light mulching of stable-manure was then put on and well watered. From that time until the flowers were cut a good soaking of liquid-manure was given each week. The Gladiolus delights in abundant moisture when well along in growth, but in its earlier stages too much water is death to it.

The first twenty-five flowers were cut for Easter, or six weeks earlier than last year. The temperature was never higher than 50° at night, and during the day-time the house was ventilated whenever it could be kept above 70°. Three things I find are necessary to successfully force the Gladiolus.

(1) The pots must be well filled with roots before the plants are finally set out.

(2) The nearer the bulbs are to the surface the less liable are the plants to damp off.

(3) The bulbs must be well ripened—and if so, small ones are as good as very large ones.

Pearl River, N. Y. *John Thorpe.*

Spring Bulbs.

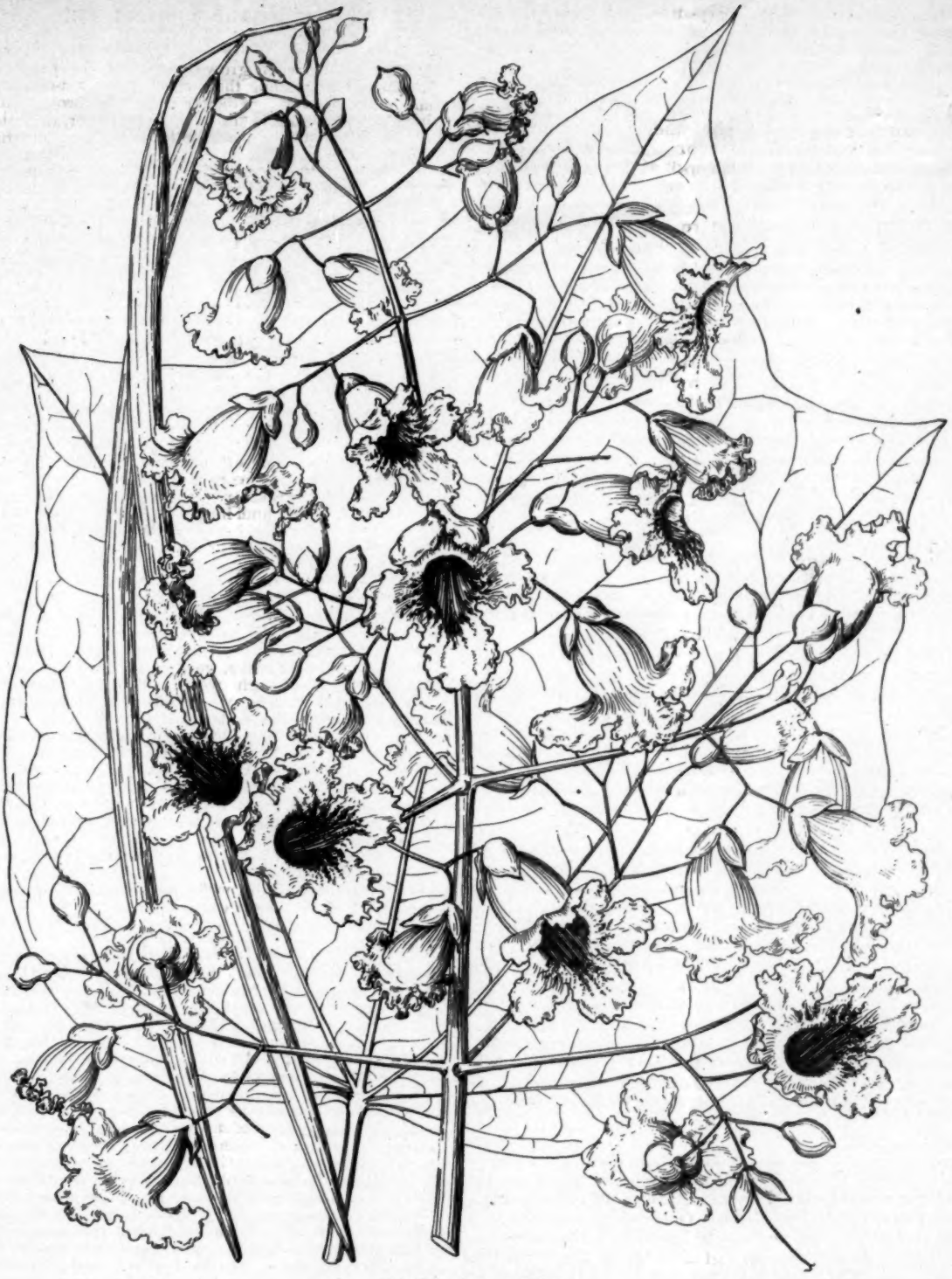
NOTWITHSTANDING the wet season of 1888, bulbs have made a very good show in my garden this spring, and I will mention a few which are worthy of general cultivation, though as yet little known except to specialists. Among the new Tulips introduced of late years from Asia, there are four of surpassing beauty, all equal or superior in size, color and form to the very best of the Dutch early-bedding Tulips.

T. Kaufmanni is the earliest of them. Of its three varieties, figured in the *Botanical Magazine* from my garden, the yellow is, perhaps, the finest, and throws up its large flower better than the rose-colored one, which seems more tender and easily spoilt by bad weather. This is the earliest of all large-flowered species of Tulip, and one of the finest and most distinct.

T. Oculus-solis var. *Mervensis* is a real giant in flower, more than twice as large as any other form of this species, and a third larger than any Dutch Tulip known to me. It measures over six inches in diameter when expanded, and seems quite hardy; but my single bulb has not yet produced offsets. Of its origin I know but little, but it is said to have been brought from Merv by Mr. Donovan.

T. Greigi is better known, but has somewhat degenerated since I first got it, and though quite hardy, does not increase. It remains, however, one of the finest species.

T. suaveolens typica, received from Dr. von Regel also under the name of Lanata, is very distinct in its downy leaves, and, when well grown, is an extremely fine Tulip in size, form and color. The flower is a pure deep crimson without any eye; the height is variable, but when increased sufficiently I think this will prove one of the best bedding Tulips of the Dutch



Hybrid Catalpa × J. C. Teas.

varieties not commonly used for bedding. I find Wouverman's Joost van Voondel in its white form, Adelaine and La Remarquable all very fine sorts. The latter I never had till this year. It is very perfect in form, and reminds me of one that I specially admired in Mr. Van Eeden's nursery at Haarlem some years ago, and which he proposed to call Mrs. H. Elwes. This is ten days earlier than any of the Van Thol Tulips, very beautiful in color, bright cerise with yellow centre, and perfect in form. I shall be glad to hear if it has been sent out, and if so, under what name.

Of other new or rare bulbous plants I have admired nothing so much as *Erythronium Smithi*, which seems a form of *E. grandiflorum album*. It is by far the finest of the Erythroniums I know, though the yellow *E. Nuttallianum*, when seen in masses as we saw it in the Yellowstone Park, runs it close.

I do not know who called it Smithi, but it is much larger in

flower than grandiflorum, with large blotched leaves flat on the ground and a tall flower-stem carrying two or three large white or pale-pink flowers. I believe it was introduced by Mr. Ware two years ago.

Of Fritillarias I find that the finest form of Imperialis is not generally known. It is much more robust and taller than the forms usually cultivated, and has flowers about three inches long. The form known in Holland as Lord Derby is something like it, but has smaller and more copper-colored flowers. The lately introduced form, Inodora, though variable in size and color of flowers, which are usually much smaller than those of the old Crown Imperial, is at least a fortnight earlier and is now quite over. Of other uncommon Fritillarias I think *F. pallidiflora* and *F. Moggridgei* are the best; the latter is perhaps only a form of the old *F. latifolia*. But when seen in large quantity there is no prettier Fritillary than the white Meleagris, of which there are many thousands in a meadow in this neighborhood, and which is easily raised from seed, though a few of the seedlings come to the usual color.

With the exception of *N. cyclamineus*, *N. Johnstoni*, and a small pretty form of *N. moschatus*, the Narcissi collected in Spain by Mr. Barr are disappointing, and I think we have pretty nearly exhausted the variety which exists in this genus, unless something can be done by hybridizing with the Glenans variety of *N. triandrus*, which is one of the most graceful and best of its tribe, though not hardy enough for a border plant.

Puschkinia Libanotica and *Chionodoxa Luciliæ*, though two of the best early spring bulbs, are becoming perfect weeds with me, and seed themselves on the grass and everywhere. Of Muscari there is none equal for ordinary garden purposes to one which I believe was brought from Rome by the late Mr. Harper Crewe as *M. conicum*. It is not so early as several others, and not so pretty in color as ligulatum, but far better than most of the sorts usually grown, and a perfect weed in the rapidity with which it increases.

H. J. Elwes, in *Gardeners' Chronicle*.

Notes on Wild Flowers.

THE Showy Lady Slipper (*Cypripedium spectabile*), now in flower, is by far the finest species we have. It grows about two feet high, with numerous, large, light green leaves along the stem, which terminates in one or more—rarely four or five—large, white, pink and purple flowers. These remain fresh several days. In the right location it is not a difficult plant to grow. In sandy, gravelly, or slaty soil, plenty of peat or leaf-mould must be added. It is a lover of moisture, and does best in the shade. It is often found in the open sunlight growing naturally, but in very moist locations, and such plants are seldom as large as those found in partial shade. Too much shade, however, is worse than none. We have noticed in thick Cedar-swamps plants growing year after year in a weak, sickly way, without flowering, when if a few rays of the sun could have reached them they would have been as strong as possible.

Habenaria viridis, var. *bracteata*, and *H. Hookeri*, two of the Rein-Orchis family, are now in flower. Both are low-growing (six to twelve inches), greenish-flowered species, not showy, but grown in collections of hardy Orchids, to some extent, both in this country and in Europe. The two large orbicular leaves in the latter, lying close to the ground, from between which comes the flowering stem, make it the more desirable of the two. As seen growing, these plants are interesting, and remain green a good portion of the season, but the flowers are too near the foliage in color to be of much value. They are easily grown, and would thrive in the shade where grass would not grow.

Saxifraga Aizoon is a rare northern species, more generally cultivated in Europe than in this country. The flowers are white or cream-colored, and rather pretty. Its natural location is on moist rocks, and when planted in ordinary soil in the sun it is apt to become too dry. Placed in the shade, it seems to be weak and sickly. On the whole, we do not think it desirable except for moist rock-work, where it would be quite valuable.

Draba arabisans, now in flower, is as pretty a plant, perhaps, as either *Saxifraga Aizoon* or *S. Virginiensis*. It grows on dry rocky banks, and would thrive in localities where few other plants would live. Its height is from four to twelve inches. It often grows in dense tufts bearing its white flowers in great profusion. We have never cultivated this plant, but believe it might be valuable in some locations, and could probably be obtained from seed better than from living plants.

Lewisia rediviva is a little, low plant, three to four inches high, from northern California and Oregon, where it is said to grow naturally in granite sand and on ledges. Its flowers are large and showy, from one to two inches in diameter, with thin, membranaceous, light purple sepals, and nearly pure white petals. We have grown it two years in a clay loam, and it has stood the winters without protection.

The Meadow-Rues (*Thalictrum Cornuti*, now in flower, which is the taller, and *T. dioicum*, which is much earlier, and not so tall, but a prettier plant), are both more desirable for their beautiful foliage than for their flowers, though the flowers of the former are pretty. But their foliage, especially that of *T. dioicum*, is very fine, and lasts from the time it is in flower until late in autumn. It will thrive on dryer ground than *T. Cornuti*, and is a desirable plant for shaded corners where other plants would not live; while *T. Cornuti* would be more suitable for wet places.

Calochortus lilacinus, one of the many species of Butterfly Tulips, is now in flower. It was sent to us from Modoc County, California. The plant is quite small, only three or four inches high, and the flowers come from near the ground on stems so short as to be worthless for cutting. They are three-fourths of an inch in diameter, white, tinged with purple, and quite handsome. The bulbs may be wintered in dry earth in the cellar. We have not tested the hardiness of the plant. Two Columbines from Oregon (*Aquilegia formosa* and *A. flavescens*) are now in flower. The former closely resembles our common *A. Canadense* in color. It is a taller and stronger growing plant, and later in flowering. *A. flavescens* has pale-ish-yellow flowers, in shape much like *A. Canadense*, but not showy. Both are desirable plants and easy of culture.

One of the prettiest wild Anemones, and a hardy one, too, when once established, is the Pennsylvania Anemone, now called *A. dichotoma*. The flowers are almost pure white, and an inch or more wide. It likes a rich, moist soil, and continues in flower for a long time.

Charlotte, Vt., June 10th. *F. H. Horsford.*

Orchid Notes.

Calanthe Dominii is an attractive and useful Orchid belonging to the evergreen section. It is one of the earliest hybrids, and is the result of crossing *C. masuca* with *C. furcata*. The broad, plicate leaves are deep green, and will remain in good condition until the new growths are well advanced. The scapes are erect, about two feet high and bear a profusion of mauve-colored flowers, about an inch across. This may be successfully grown in rich stove-plant soil in an intermediate temperature, and kept moist all the year round.

Vanda Batemannii. This noble species is now in flower. It is of immense growth, only suitable for large houses, as it will grow to a great height. The stem is stout, closely clasped with long, narrow, deeply channelled, leathery leaves. The racemes which spring from the axils of these are erect, stout and about six feet long, bearing a great many very handsome flowers. These are thick, dull, flesh-colored, blotched with crimson in front, while the back is rosy-purple. The racemes last nearly the whole summer, growing, and developing new flowers from the apex. The plant was introduced nearly fifty years ago from the Moluccas, and requires the most liberal treatment in respect to heat and water. The pots should be well drained and the potting material should consist of lumps of peat, chopped moss and nodules of charcoal, with a few lumps of dry cow-manure. It blooms very freely with us, and should it ever become "leggy" the head can be cut off in early summer and potted, when it will quickly become established. The old stem will produce a number of shoots, and these may be taken off as soon as the new roots appear, and will make better looking plants than when left on the old plant.

Epidendrum vitellinum is an Orchid to be commended. It flowers at a somewhat dull season, and a few spikes of its gay and unique colored flowers go a long way to brighten and bring out the sober tints of the Odontoglossums, with which this species should be grown. It is generally distributed through Mexico and the adjoining states, usually found growing on rocks or stumps of trees at high altitudes and under such conditions as the cooler Odontoglossums need, and it requires the same treatment as recommended for these. It grows freely, however, on blocks or rafts of wood, and should be kept somewhat dryer during the resting season. The clustered bulbs are ovate-lanceolate, with two acute, oblong ligulate leaves, both leaves and bulbs being of a peculiar glaucous hue. The erect racemes are often branched, and bear from twenty to thirty flowers about an inch across, the color being a vermilion-orange. The acute lip and the column is of bright yellow, while the anther-cap is red. The flowers last about two months

in perfection. The variety Majus is distinguished by its stronger inflorescence, and this is developed earlier in the season than that of the type.

Kenwood, N. Y. *F. Goldring.*

Spraying Fruit-trees.

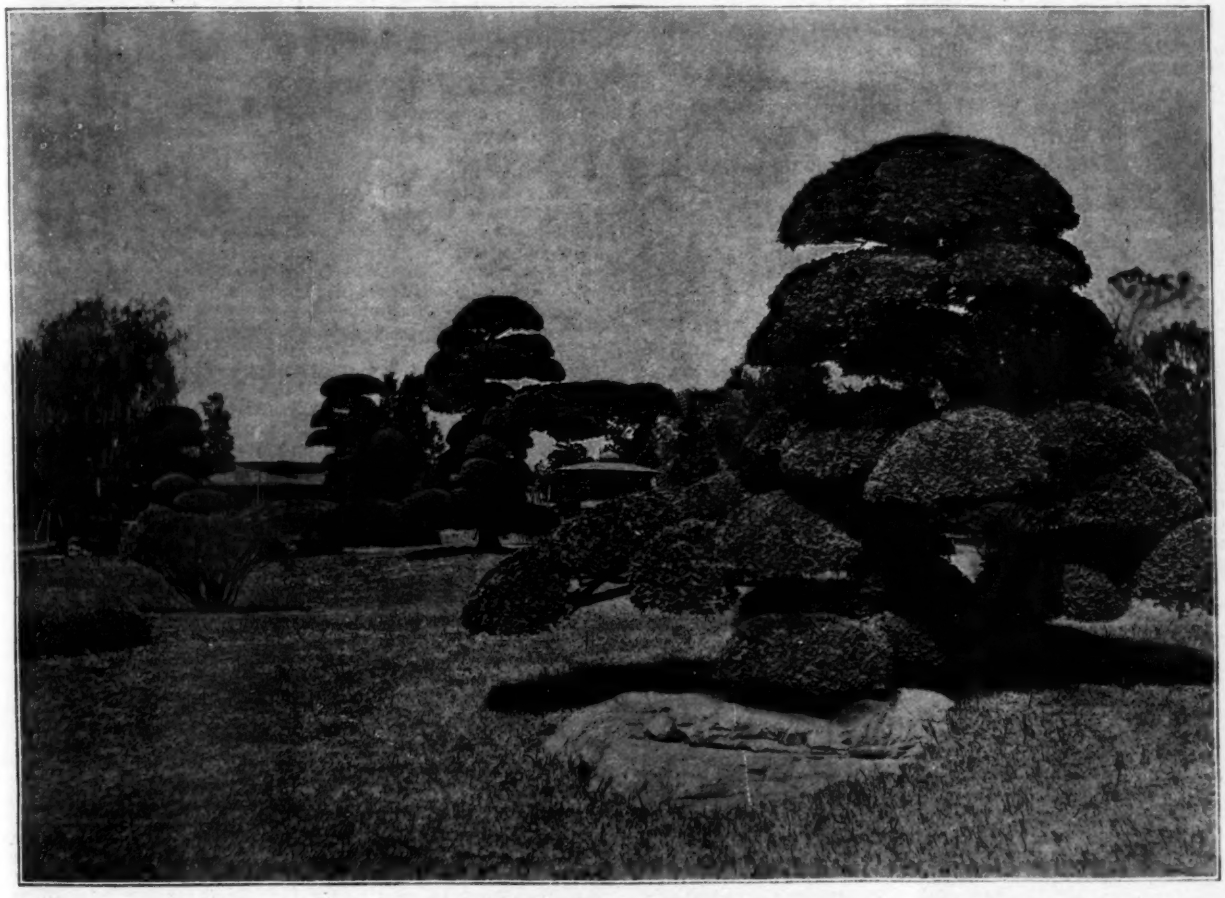
THE most important accession to recent horticultural practice is the spraying of fruit-trees with arsenical poisons for the destruction of various insects. No orchardist can afford to neglect this practice. The codlin-moth, curclio, canker-worm, tent-caterpillar and other insects are destroyed by this operation, and sometimes three or more species are killed by the same application. Experience has shown the best methods of applying the poisons, and we now know that the essential points of the operation are to use a very dilute mixture, and to apply it with great thoroughness. London Purple, when pure, is better than Paris Green, and is cheaper. A pound of the London Purple to 250 or 300 gallons of water is sufficient. Apply it until the liquid drips from the foliage in all parts of the tree. The apparatus should be such that the liquid will be driven with great force in a fine spray. A gallon of liquid will cover an Apple-tree twenty-five or thirty years of age.

A single spraying of Apple-trees, if the operation is not immediately succeeded by heavy rains, is usually sufficient; although a second application is always advantageous. Two or three applications should be made upon Plums, Cherries and Peaches, and I have met growers who make as many as five applications. Even five applications are much cheaper and easier than any other method of destroying the curclio, and the practice is much more effective. In young and open orchards the spraying can be well done with a machine which works from the wagon-wheel, but in large and thick orchards —those most in need of treatment—the operator must stop at each tree if the work is to be thoroughly done. A tank or cask upon a wagon, a pump with much power, one man to pump and one to drive and hold the hose is a profitable outfit. With such an outfit two men can spray from 250 to 300 Apple-trees, thirty years old, in about half a day. Pear-trees are treated in the same manner as Apple-trees. The mixing of flour with London Purple, in order to make the poison stick to the leaves, does not appear to meet with much favor among practical men. *L. H. Bailey.*

Cornell University.

Heating Green-houses.—At the recent Convention of American Nurserymen Mr. Peter Henderson read a paper on this subject, from which we make the following extracts:

"In my judgment, when the range of glass is sufficient to justify the employment of a night watchman, say 50,000 square feet, steam has several advantages over hot water, chief of which are the exact regulation of temperature, which can be obtained by close attention, consequent economy of fuel, and the convenience of placing the heating furnaces all at one point. For example: We have a range of glass where the extreme point is about 600 feet away from the boilers; it would hardly be practicable to heat by hot water at that distance. And yet for all medium and small-sized green-house establishments, whether for commercial or private purposes, we recommend the use of hot water. The size of the green-house or green-houses to be heated must determine the capacity of the boiler wanted; but the boiler being properly apportioned to the length of pipe, the following data from our own establishment, where the houses are twenty feet wide and 100 feet long, may be useful: When a night temperature of seventy degrees is required in the coldest weather, ten rows of four-inch pipe, five on each side, are used; when sixty degrees are wanted, eight rows of pipe, four on each side; when fifty degrees are wanted, six rows of pipe; and when only thirty-five or forty degrees are wanted, four rows of pipe. This is for the latitude of New York City, where the temperature rarely falls lower than ten degrees below zero. Latitudes north or



A Japanese Garden.—See page 302.

south of New York should be graded accordingly. If estimated by glass surface, about one foot in length of four-inch pipe is necessary for every three and a half square feet of glass surface, when the temperature is at ten degrees below zero, to keep a temperature of fifty degrees in the green-house. A one and a quarter inch pipe when heated by steam does almost exactly the same amount of heating as a four-inch pipe heated by hot water.

Aster alpinus albus is probably the earliest species of this genus to bloom. The flowers are produced with the early summer, and, for this reason alone, the plant is worth cultivating, but the flowers are two inches in diameter, with bright yellow discs and double rows of white ray-petals. It has been written of this plant that, in comparison with the type, *A. alpinus albus*, it is poor and difficult to cultivate. With *A. alpinus* we have had no experience, having tried in vain to obtain the true plant. But here in the open border the white form thrives and increases rapidly, making bushy plants about six inches high, which, in early summer, produce numbers of pretty white flowers on stems just above the leaves.

Gillenia trifoliata has recently been noticed in Garden and Forest as a desirable border plant; and for cutting and decorative purposes there can be no more useful one, the flowers have such a light, graceful appearance, and blend so nicely with other flowers for in-door decoration. The genus Gillenia contains but two species, the other being *G. stipulacea*. To the casual observer this plant, when in flower, appears to be the same as *G. trifoliata*, but on close examination the specific difference is easily distinguished. *G. stipulacea*, as the name implies, has large and well-developed stipules, and commences to flower when *G. trifoliata* is about done blooming, and so makes a good succession. It is singular that, although indigenous to this state, *G. trifolicta* never produces seed with us under cultivation, while *G. stipulacea* every year seeds freely. The seeds, if sown as soon as ripe in a shady place, germinate the second year after sowing. This may seem a long time, but, taking into consideration the fact that this genus is included in the family of *Rosaceæ*, it is not difficult to comprehend.

Silene Pumilio is one of the very best of the tufted Catchflys, and is suitable alike for cultivation in the rock-garden or open border. This plant has dense tufts of bright green foliage, now almost hidden by the profusion of pretty rose-pink flowers, the inflated calyxes of which are of the same rosy hue as the flowers. *S. Pumilio* is a native of the Alps, and succeeds well in the open border without protection. The plant may be readily increased by division, but seeds are freely produced, and these, when sown as soon as ripe, germinate the following spring, and soon form strong plants.

O.

Notes from the Arnold Arboretum.

Celastrus scandens, the Climbing Bitter-Sweet or Roxbury Wax-work, as it is known in eastern New England, is now in flower. This plant should be so well known that even a bare mention of it would be superfluous. It is a common native species, climbing high over bushes and trees; and although the small white flowers are inconspicuous the foliage is good, and the orange and scarlet fruit is so showy and hangs so late in the autumn, that this is really one of the most desirable of hardy climbing plants. It is well suited to plant where it can display its brilliant fruit, either on trellises or in the wild garden, where it will stretch over rocks or among trees and other shrubs.

Two other species in the collection are worth notice. They are *C. articulata*, Thunb. (a misprint, no doubt, for *orbiculata*, as M. Maximowicz has pointed out, *Mel. Biol.*, xi. 200), a widely distributed Japanese species, with broadly obovate, crenately serrate, membranaceous leaves. They are three and a half to four inches long, contracted at the base into a stout petiole an inch and a half long, and usually terminated by a short, broad point. The flowers are small and green, in short axillary clusters, which are quite hidden by the ample foliage. The fruit is smaller than that of our American species, but it is very brilliantly colored, and, as it is produced here in the greatest profusion along the whole length of the spur-like lateral branches, it makes a great show after the leaves have fallen, remaining fresh and bright until nearly the end of winter. *C. articulata* is a hardy and vigorous plant, growing rampantly when once established in rich soil, and then sometimes producing stems twelve or fifteen feet long during a single season, and immense masses of foliage. It is a good plant for covering quickly rocky slopes or walls, out-buildings and other structures. It has inhabited the Arboretum for several years, having been sent here from the Parsons' Nursery at Flushing. *Orixa Japonica*, No. 1,215 of the Kew Arboretum herbarium, is our plant.

It may be well to mention here that *Orixa Japonica* (often known as *Celastrus Orixa*) is perfectly hardy here. It is a tall shrub, already some six or eight feet high, with rather slender, spreading branches, and lustrous dark green, obovate leaves. The minute green flowers, which appeared a month ago, are produced in axillary clusters. The male plant, unfortunately, is the only one in the collection, so that fruit has not been produced here. The bruised foliage and the wood are pleasantly and pungently fragrant with the odor of our Spice-bush or Benzoin. This shrub is very generally used as a hedge-plant by the Japanese of the central Island.

The second exotic Celastrus in the collection, now in flower, is one of the Himalaya species, in which the branches are covered with pale lenticular warts, and the flowers are borne in short terminal racemose cymes. The persistent style crowning the fruit points to *C. stylosa*, to which our plant probably belongs, although I am unable to verify this determination by a reference to an authentic specimen or to a figure. This plant was received from the *Arboretum Segrezianum* several years ago as *C. paniculata*, a tropical or subtropical Indian species, with pendulous panicles of flowers. Our plant, although perfectly hardy, is a less vigorous grower than either the North American or the Japanese species, not climbing here to a greater height than six or eight feet. The leaves, when fully grown, are four and a half inches long, elliptical or ovate-oblong; they are acute, crenately serrate, and borne on rather stout petioles an inch long. The pale green or nearly white flowers are produced in terminal racemose cymes, which, in fruit, are about three inches long. The fruit is orange, crowned with the style, and rather showy. This plant, if our determination is correct, is widely distributed through the Sikkim Himalaya, and in the Khasia Hills, ascending to an elevation of 6,000 feet above the sea level. It is the least desirable of the species in the collection as an ornamental plant.

A handsome Japanese arborescent Euonymus received from the Flushing Nurseries is now covered with flowers. M. Maximowicz, to whom specimens were submitted last year, pronounced it to be the Japanese form of the widely-distributed *E. Europæa*—his var. *Hamiltoniana*—which is found also from Cashmire through the Himalayas, Mongolia, northern China and Manchuria, and which has been described by botanists under a multitude of names. As it grows here it is a bushy tree six feet high, with a stout trunk covered with smooth gray bark, spreading branches, terete, or slightly angled bright green branchlets, and abundant foliage. The leaves are oblong, acuminate, serrate, two or three inches long, and deep dark green. The cymes of small greenish-white flowers are axillary and dichotomous, and these are followed by four-lobed, wingless, yellow capsules, which are not particularly showy. According to Brandis (Forest Flora of India), whose figure (*t.* 16) represents a form with much narrower leaves than those of our Japanese plant, this variety is common in the forests of the outer Himalaya ranges up to 8,500 feet, growing, under favorable circumstances into a tree thirty to thirty-five feet high, with a short, straight trunk four to five feet round. The wood, he says, is beautifully white, compact and close grained, and used for making spoons. The Japanese plant is so hardy, it grows with such vigor, its foliage is so abundant and of so rich a green, that it promises to be a good addition to the number of small, hardy trees which can be successfully cultivated in this climate.

Spiræa Cantoniensis (*S. Reevesiana* of many gardens) is rarely seen in such great beauty in this climate as it has been this season. This plant suffers generally from cold, losing much of its wood, but this year the mild winter has been favorable to it, and both the single and the double-flowered varieties have bloomed in perfection. It is not only one of the very handsomest of all the Spiræas which produce their flowers in flat corymbs at the ends of short lateral branches of the year, being only surpassed in beauty of flowers, perhaps, by *S. Van Houttei*, but it has the additional merit of flowering considerably later than the other plants of its class. In climates less severe than that of New England, *Spiræa Cantoniensis*, especially the single-flowered variety, is one of the most beautiful spring-flowering shrubs which can be planted in the garden.

Cotoneaster tomentosa is a hardy shrub of good habit, agreeable foliage and rather pretty flowers, which are followed by showy fruit, as is the case with nearly all the species of this

genus, which is not made enough of in our gardens. This species grows here to a height of two or three feet, with upright branches, covered with elliptical, obtuse leaves, densely covered on the lower surface with pale pubescence, as are the peduncles and calyxes of the small pink flowers. The fruit is black. This is a widely-distributed plant through the mountainous regions of central and southern Europe.

Cotoneaster laxiflora is a more showy plant than the last, growing to a height of four or five feet, with slender diverging branches covered with dark-brown lustrous bark. The leaves are oblong, obtuse, smooth on the upper, somewhat pubescent on the lower surface, as are the nodding, elongated racemes of pink flowers, to which succeed showy, scarlet berries. This is certainly one of the most showy and desirable of the perfectly hardy species of this genus in the collection. The origin and relationship of this plant are rather obscure. It is possibly a form only of *C. vulgaris*, and it may have been brought originally from Siberia. According to Loudon (Arboretum, ii., 871) it was first made known from plants raised in the garden of the Royal Horticultural Society at Chiswick, from seeds sent by Professor Jacquin in 1826. But whatever may be the origin and the native country of this plant, it well deserves a place in the garden.

Syringa villosa (see GARDEN AND FOREST, vol. i., pp. 222, 520 and f. 83) has, now that the plants are thoroughly established, and of large size, flowered here more abundantly than it ever has before. It is certainly an ornamental plant of the first-class and one of the most important introductions of late years among hardy shrubs. It has, moreover, the merit of flowering late, and long after the flowers of other Lilacs with long-tubed corollas, with the exception of those of *Syringa Josikæa*, now believed to be a variety of our plant, have faded. Two quite distinct varieties of *S. villosa* occur here. The first with narrower leaves and narrower panicles of lighter-colored flowers than the second, which is of more vigorous habit, and promises to grow into a much larger plant. This last, which was raised from seed sent from Pekin by Dr. Bretschneider, flowers about ten days later than the first. It is worth noticing that the terminal bud, which is never developed in *S. vulgaris*, grows always in this species, generally producing a cluster of flowers, so that the branch may be terminated by three instead of by two panicles. The flowers of this species, unfortunately, have not an agreeable perfume, the slight odor which they emit resembling that of the flowers of the Privet, and therefore rather disagreeable.

Vaccinium erythrocarpon, one of the "Bearberries" of the southern Alleghanies, is beautifully in flower. This is a handsome plant, and botanically a most interesting one, serving, as it does, to connect the Cranberry and the ordinary forms of Vaccinium—that is, it has the foliage and fruit of the Blueberries and the flowers of Oxycoccus. It is a tall, rather slender, divergently-branching, graceful shrub, growing sometimes in the Carolina mountains to a height of eight or ten feet. The leaves are thin, oblong-lanceolate, finely serrate with bristle-tipped teeth. From the axils of the upper ones the scarlet or flesh-colored slender flowers hang from long nodding pedicels. The fruit, which before it is quite ripe, is scarlet (whence the inappropriate name), becomes at maturity deep shining black in color, and is then much more juicy than the fruit of any other species of Vaccinium. The flavor, however, is insipid, and the fruit is nowhere greatly esteemed except by bears, who, when it is ripe, resort to the high mountain-tops, where this plant often covers extensive areas, for the purpose of feasting upon it. *V. erythrocarpon* is not a very easy plant to manage in cultivation. Perhaps it is not quite hardy here, although it now seems well established and to promise well for the future.

It may be of interest to note that the plants of the white-fruited Huckleberry, described in GARDEN AND FOREST (vol. ii., p. 10) and sent to the Arboretum by Mr. B. A. Westbrook, of Montague, New Jersey, are now finely in flower and promise to produce a crop of fruit.

Rosa multiflora is certainly one of the most beautiful of the Japanese plants cultivated in our gardens, and it is a matter of surprise that the natural single form is so rarely seen and so little known. The origin, in a large part at least, of the so-called Polyantha Roses, none of its descendants compare in beauty with the plant which Thunberg first made known to science a century ago. This is a stout bush with long, robust stems, arching above the middle, growing to a height of eight or ten feet and forming a broad mass of pleasant green foliage, ten or twelve feet through. The stems are round, smooth, bright green and armed with remote, broad, recurved spines, and terminated by great compound racemes, twelve to fifteen inches long by eight or ten broad, of flowers the size of a shilling, the pure white petals contrasting charmingly with the golden stamens. So abundant are the flowers that the plants at this season are completly hidden by them, and as all the flowers in each raceme do not open at once, but gradually, a couple of weeks often elapsing between the opening of the first and the last, the plants are in flower for a long time. There are two forms here. One of them flowers ten days before the other; this is a less robust plant than the other, with much smaller flowers, and generally a less desirable subject for cultivation. *Rosa multiflora* should be planted in rich soil, where it will not be crowded by other plants, and where it can have sufficient room to grow naturally and spread out its branches in all directions. It is not easy to imagine a more beautiful object than a well-established specimen, planted in this way, when it is in flower. The fruit, which is hardly larger than a pea, is produced in the greatest profusion, and is rather ornamental, remaining upon the plants until the appearance of the leaves the following spring.

The Arboretum is indebted to Max Leichtlin for this plant, who sent seeds here several years ago. It has been somewhat distributed from the Arboretum among American collections, but it is hardly known yet or properly appreciated. *J.*

June 12.

The Forest.

Forest Interests in Pennsylvania.—II.

THE soil of a large proportion of the mountain region of Pennsylvania was originally of good quality, strong and fertile, as compared with most of the mountain land of the northern and eastern States, and it was well adapted to sustain a valuable and permanent forest-growth. Of course, if the mountain forest-land was properly treated it would become steadily richer, would continue to increase in fertility forever. It would thus not only produce more and more timber as time goes on, but the timber growing upon it would perpetually improve in quality also. That such is not now the case does not result from any poverty or incompleteness of the natural resources and adaptations of the region, but is the effect of human ignorance and mismanagement. Much of the land is now poorer than it has been for thousands of years before, and even if it could be well taken care of henceforth—of which there is, of course, no prospect—it could produce only inferior timber for ages to come.

The principal agent in the injury and destruction of the forests here is fire. Every year vast values are totally blotted out. Timber worth hundreds of thousands of dollars is consumed. But this loss is trivial compared with the mischief of the permanent impairment of the fertility of the soil, which results from burning the forests.

The most intelligent and observing men in all parts of the state say that a very large proportion of forest fires are purposely started. In some of the mountain counties the law permits cattle to run at large for pasturage, and owners of stock set the woods on fire to promote the growth of grass. The people who gather berries are also interested in having the forests burned frequently; and fires are convenient for hunters, because they maintain and extend areas of open woods. Large tracts of valuable timber are often set on fire by men who want the job of cutting it off, as they know that it must be utilized immediately after it is burned over, or it will be worthless. Some fires result from sparks thrown out by railway engines, but the people of Pennsylvania do not believe very much in the accidental origin of forest fires in their state.

The law which permits owners of cattle to pasture them on other peoples' land should be changed. Pasturage is, in itself, fatal to the perpetuity of forest conditions, and nothing effective can be done for the preservation of the woods while cattle are allowed to run at large in them. When this arrangement for forest-pasturage operates as an inducement to set the woods on fire it is idle and useless to talk of devising means for preserving the forests unless this premium on their destruction is abolished. It is comparatively easy to obtain almost any legislation that may be desired. A little systematic and intelligent agitation is all that is required for this object. It would, doubtless, be worth while and profitable for the people of the state to undertake the care of the mountain woods, if any plan for their preservation could be made effective. Differences in details, in organization and methods would be of slight importance if the essential object—the protection of the woods from fire—could be accomplished by any system of forest guardianship.

The maintenance of forest conditions on the mountains of the state is indispensable to the permanent prosperity of the people. The woods have most important and vital relations

to the steady and equable flow of the streams which have their sources in them. If the woods on the mountains become extinct the streams will be destructive torrents in the spring season, and their channels will be dusty and wind-swept in summer, so that, as now in the West, the course of a river can be traced from afar by the clouds of dust always rising from its bed in dry weather. The soil will be washed down from the mountains into the streams, the inert clay, sand and gravel will follow, and will bury the fertile lands near the foothills. The area of farm land will thus be diminished more and more, and the fertility and productiveness of what is still cultivated will steadily decline.

It is in every way probable that this is what will, in time, actually occur. If existing conditions and tendencies are continued—that is, if the mountain forests are still burned as now—the time will inevitably come when there will be no trees or verdure on the mountains of Pennsylvania, and no soil. Instead of the noble and satisfying sylvan beauty which is now the pride of the state, there will remain only the wrecks and skeletons of the mountain chains, unsightly mounds and ridges, eroded by the wind (which will fill the air of the lowland regions with dust), seamed and scarred by torrents, and rent by horrid gulfs and chasms; a blasted and ruined land, the result and monument of man's incapacity.

To prevent these consequences would require the consent and coöperation of conditions and agencies which do not now exist. The processes of forest destruction which are now in use belong to and represent exactly our present stage and degree of civilization. The perpetuation and rational treatment of forests would be a feature of a stage and degree of civilization which we have not attained. The question whether we can save our forests is really the question whether a distinct and specific advance in civilization is now possible for us, and whether it can be made in a very short time. Some of the indispensable changes, to be availing, must be provided for by prompt and decisive action. But this is precisely what is least likely to be done.

Let us use a little analysis, and try thus to distinguish the essential features and conditions of the problem. Prompt, decisive and intelligent action is required, but there is nobody to take such action. The central difficulty lies in the fact that the results of destroying mountain forests become apparent, so slowly, that men are not impressed by them, do not care, are not interested about them. We are not sufficiently intelligent or civilized to understand or realize the effect or ultimate results of existing conditions and tendencies.

The prompt and decisive action which the situation requires is the establishment of a system of preliminary educational work. No efficient or successful system of forest-management is possible with our present national character and degree of intelligence. We have not sufficient thought, foresight, patience, or organizing capacity. We need in each state a considerable number of persons possessed of a degree of acquaintance and familiarity with the subject of forestry, in all its principal aspects and relations, such as very few of our people have reached. If such a journal as Garden and Forest, with its thorough, coherent and continuous discussion of forestry subjects, could be read habitually for some years in every school and institution of learning in this state, and by ten or twenty thousand of its leading citizens, we might then have here such conditions of knowledge and thought as would constitute the soil and atmosphere needed to produce a better civilization, and a practical and effective system or method of forest preservation and management might then be evolved.

J. B. Harrison,
Snow Shoe, Pa., June 10th. Cor. Sec. American Forestry Congress.

Correspondence.

The Purple Beech at Throgg's Neck.

To the Editor of Garden and Forest:

Sir.—In your article of May 8th upon "The Purple Beech" you mention two notable specimens of the variety—the great tree on the Lyman Estate, at Waltham, of which you give an illustration, and the tree spoken of by Downing as growing on Throgg's Neck, Westchester County, New York, and declared by him to be the finest in the United States. You add the remark that this tree, if still alive, is probably much larger than the one at Waltham.

Thinking that the record should be completed, I have made the necessary inquiries. It appears that the Westchester tree died about six years ago. It grew on what is known as the Van Schaick Place, which was in former years owned by Mr. Thomas Ash, and was a place of resort of the distinguished guests of the old Astor House in the palmy days of Stetson. Hence the tree is mentioned, as I am informed, by Dickens in his American Notes.

Tradition has it that the tree was brought from England about one hundred years ago. It stood in an open field with no other tree near it, and was perfectly symmetrical in form, the lower limbs sweeping the ground and "spreading about thirty feet on each side." At one foot above the ground it measured four feet eight inches in diameter, and at a height of five feet, four feet three inches.

It would therefore appear to have been no larger than the Waltham tree in the trunk, and to have had a somewhat less spread of limbs. But the measurement of these old Beeches is a very uncertain matter, from the buttressed, gnarled and embossed nature of their trunks. It is sufficiently evident, however, that these two trees were of about the same age and of substantially the same size, the Westchester tree being of the finer form.

The cause of the death of the Westchester tree is said to have been an overdose of manure. I am sceptical on this point, chiefly for the reason that some years ago the Waltham tree also showed ominous signs of failing. It recovered, however, under a course of nutrition at once set on foot by the late G. W. Lyman, which has been continued by his successor. May it not rather have been that the symptoms in the Westchester tree were not soon enough observed? At all events all lovers of fine trees must mourn its untimely end. I may add that Dr. Asa Gray stated a few years ago that the Waltham tree was the largest he had ever seen, either in this country or in Europe.

Belleport, N. Y. *George Theo. Lyman.*

Peter Henderson's Plant Factory.

To the Editor of Garden and Forest:

Sir.—No title which now occurs to me would so accurately characterize the great establishment on Jersey City Heights as the one I have used as the head-line to this letter. In money value the annual sales from some of the foremost European nurseries would largely exceed, no doubt, the amount realized from the plants annually sold by Mr. Henderson. But it is probably true that the plants raised and sold here, one year with another, exceed in number those produced at any nursery in the world. This means that Mr. Henderson's business is not mainly with rare and costly plants, and that he does not take the time to prepare finely-grown specimens. His plan is rather to produce saleable plants as quickly as possible, and to market them out of the way for another lot as soon as they can be sold. With some of the plants, like Coleus, which root most readily, a crop can be sold every four weeks from the first of January to the middle of June. Such rapid propagation is not possible with all plants, but Mr. Henderson would not consider that he was running his establishment up to its ordinary capacity if he did not secure at least three crops a year from his entire space under glass.

Here are fifteen acres, four acres of which are under glass, devoted to the raising of plants; but this space alone can hardly be considered a measure of the productive capacity of the establishment. Every square foot is worked under high pressure. No device for saving time or labor is neglected. Improved processes are being adopted continually. Mr. Henderson is as alert to-day as he was twenty-five years ago to grasp a new idea, and the men in closest contact with him catch something of this spirit, so that a genuine advance in different points of practice is made every year. Under the complete and well-directed organization of the concern everything moves with celerity, smoothness and regularity, like a perfect machine which turns out plants by the million at the minimum cost of production. Thus it comes about that although the volume of business increases largely from year to year, there are actually fewer men on the pay-rolls than there were fifteen years ago. It should be added that the wages paid the smaller number exceed in total amount what was formerly paid, for many of the men have become so expert in some particular kind of manipulation that their services are worth a great deal more.

"It looks like slaughter," said Mr. Henderson, "to sell plants at a dollar a hundred, but it is a fact that the actual cost to us of producing these plants is often no more than thirty cents a hundred. Here are the figures: Four men will take off, make and put in the bench 10,000 cuttings a day; two men and a boy, or say three men, will pot the same when rooted in another day; three men in a day will knock the plants out of the pots and pack them in boxes. That is, ten days' work has been all that was needed to get 10,000 plants ready for market.

If we call this labor worth $15, we can add $15 more as a good allowance to be charged against the plants for firing and delivery, so that $30 is a liberal estimate for the cost of the 10,000 plants. The same could be proved of some plants raised from seed—such as Asters, Balsams, Drummond's Phlox, etc., so that even with expensive structures, on land where every building lot of 100 feet by twenty-five is worth $1,000, there is no actual loss on certain plants even at the low price mentioned when they are sold in sufficient quantities."

Of course these results can only be achieved in a large way, where the system is perfect, the labor skilled, and every motion intelligently directed. No spade is used where a plow can work. The ten acres are plowed deeply, pulverized with an acme harrow and smoothed with a disk harrow, which does finer work than any steel rake. Upon these acres, where the plants will average one to every square foot, one man constantly at work with a wheel-hoe and one day's work a week with a horse furnishes all the cultivating needed, with a little hand-weeding in the rows. To do this work on the old-fashioned plan, with hoes, would cost five times as much, and it would not be done half as well. Of course improved processes are not confined to this establishment, and many of them were not used here even five years ago. But it is true not only that improved methods are adopted here as rapidly as they are discovered, but also that many items of practice, with which every plantsman in the country is now familiar, originated here. There is no question but that the system of packing which so reduced the weight of plants, while it added to their safety in carriage, was practically begun and perfected here. Occasionally, to this day, one receives a huge box of plants still in pots, or a package in which the plants are rattling about loose, or are smothered or drowned. But perfect packing is recent, and it began here, where the plants were first knocked out of pots, wrapped in paper and set snugly, so as to carry safely for a week. It is true also that many other practical suggestions, like the "saucer system" of propagating, the snapping quality of a good cutting, and even the necessity of "firming the soil," which many another man may have known as a part of his personal experience, were first brought publicly forth and insisted upon by Mr. Henderson in some of his publications, so that while improving his own work by observation, he has done as much as any of his contemporaries, both by precept and example, to scatter the fogs of tradition and introduce simpler, cheaper and more efficacious methods in horticultural practice.

Having spoken of Mr. Henderson's writings, it is worth stating that his "Gardening for Profit" was about the first book on vegetable-gardening which was literally written out of the soil, by a man who was working with practical purpose. The intense methods of cultivation which the necessities of tilling high-priced land developed were a revelation when described in a straightforward way by one who was simply making record of his daily practice and the reasons for it. It was a lesson which many a farmer never forgot, when he learned that the market-gardeners about New York found it paid them to use seventy-five and even a hundred tons of well-rotted manure on every acre of their land — found, indeed, that their business only paid when they used this amount every year. This book has been in print twenty years, 150,000 copies have been put in circulation, and it is selling yet. A book like this does good, but it also naturally advertises its author, and, in fact, the name of Peter Henderson is as familiar as that of any other in connection with American Horticulture. He believes in printer's ink, however, and of his large catalogue alone he circulates every year 200,000 copies, at an expense for postage alone of $14,000.

I add a list of the number of some of the more important plants sold during the year, not so much to give an idea of the volume of business transacted as to put on record the comparative demand for these staple plants in this year of grace 1889. Roses led, with a sale of 400,000 plants. The sale of Tuberoses reached 300,000, but they were not grown here. Chrysanthemums, Verbenas, and Coleus were sold to the number of 200,000 each. Then follow Geraniums, 150,000, and Alternantheras, 100,000. Ipomœas of various kinds and Dahlias, double and single, sold to the number of 75,000 each, while of Pansies and Carnations, 50,000 each were produced. Ampelopsis in variety reached 25,000, while Cannas, Echeverias and white-leaved plants like Centaurias amounted to 20,000 each. Estimating together annuals from seed and varieties on the "general list" rather more than half a million were sold, besides those named above. 3,000,000 Celery-plants is the first item on the vegetable list, with 1,000,000 Cabbage-plants and 200,000 Cauliflowers, about 100,000 each of Tomatoes and Lettuces, 20,000 Egg-plants and 15,000 Pepper plants. Asparagus roots numbered 300,000, but these, too, were grown elsewhere, while only 5,000 plants of Rhubarb were needed. Of Strawberry plants, mostly pot-grown, 300,000 were sold; of Grape-vines, 10,000, and of Blackberries, Raspberries and Currants together, 25,000 plants.

Jersey City. *S.*

Exhibitions.

The Rose and Strawberry Show of the Massachusetts Horticultural Society.

THERE is little to be said of the Rose Show held in Boston last week. It is many years since so poor an exhibition of the Queen of Flowers has been seen at her annual festival. The season has been very unfavorable for the development of good Roses. Excessive heat and constant rains have made the flowers both early and small, and they have dropped almost as soon as they opened. It is not surprising that the exhibition, under the circumstances, was not a large or a fine one. It is rather a wonder that it was as good as it was. There were few plants, or flowers besides Roses displayed, and the halls looked bare and anything but attractive. John L. Gardner, the Short Hills Nurseries and E. W. Gilmore, made small displays of Orchids. The best plant in the first collection was a well-grown, clean little specimen of *Dendrochilum filiforme*, which received a first prize for the best single Orchid. The best plant in the Short Hills collection was a very well-flowered specimen of the handsome *Trichophilia crispa* from Costa Rica. The first prize for a specimen plant was taken by Mr. Gardner, with a good plant of *Gymnogramma schizophylla*, a lovely Jamaica Fern, comparatively new to cultivation, having been introduced into England as late as 1880.

Edwin Shepard & Son staged a remarkably fine collection of Delphiniums; and there were some interesting and attractive collections of wild flowers, brought from the woods and meadows by Mrs. P. D. Richards and Mr. E. H. Hitchings. The custom of exhibiting collections of wild flowers, which has grown to be a feature of all the summer shows of the Massachusetts Society, is one of the most instructive and useful things fostered by it, and has done much to make the local flora known, and its beauty appreciated.

The great collections of well-grown and tastefully arranged plants which a few years ago were always seen at the principal Boston flower-shows, and which made them the most interesting and instructive held in America, were sadly missed, as they have been of late years. The halls of this Society are not well suited for such displays, and the owners of the great gardens near Boston are tired, perhaps, of having their plants injured without any adequate return for their pains. But whatever the cause of the falling off in the number and variety of exhibits may be, the public are not the only losers, as horticultural enterprise and enthusiasm must suffer for want of healthy stimulus and friendly competition.

The first special Lyman prize for Roses was not awarded; the second went to William H. Spooner, and the third to Warren Heustis & Son. For twelve distinct-named varieties of Roses, three of a kind, Mrs. Francis B. Hayes took the first prize; W. H. Spooner the second, and Warren Heustis & Son the third. Other prizes were taken by Joseph A. White, Dr. C. G. Weld, J. B. Moore & Son and Joseph Clark.

Larger or more beautifully-colored Strawberries have not been seen in Boston. Sharpless and Belmont appear to be the favorites with Massachusetts exhibitors; and these berries were shown in great perfection. For the best two quarts, to be judged by a scale of points, the first prize was taken by Prince of Berries, shown by Thomas C. Thurlow; the second by Belmont, shown by Warren Heustis & Son, the raisers of this variety; the third for the same, shown by Isaac E. Coburn, and the fourth by Miner's Prolific, shown by Samuel Barnard. The Society's silver medal was given to Stephen Hoyt & Son, of New Canaan, Connecticut, for Yale—the "best exhibition of a seedling Strawberry introduced within the last five years, and never having taken a prize." Parry, May King, Jessie and Jucunda were shown in good condition.

Recent Plant Portraits.

LUCULA GRATISSIMA, *Bulletina dela R. Soc. Toscana di Orticultura*, April.

ÆRIDES EXPANSUM LEONIÆ, *Gartenflora*, April 15th.

PICEA ALCOCKIANA and P. AJANENSIS, *Gartenflora*, April 15th.

FORSYTHIA VIRIDISSIMA and F. SUSPENSA (figures of the fruit), *Revue Horticole*, April 16th.

Notes.

The Veitch Memorial Medal, a much-coveted honor in England among gardeners, has just been bestowed upon Mr. A. F. Barron, the well-known superintendent of the Royal Horticultural Society's garden at Chiswick. In his special branch, pomology, Mr. Barron has no superior, and his latest book, "Vines and Vine Culture," in a measure supersedes all English books on the subject.

A correspondent of a foreign journal notes that in the Jardin des Plantes, in Paris, may be seen two or three old Chinese Peach-trees which, as a rule, bear double white flowers; but among these are some flowers of a rich, deep crimson, wholly free from white markings. From a long distance, he says, these crimson flowers are conspicuous, especially when a single one appears, like a brilliant little rosette, on a twig otherwise entirely white.

In reply to Mr. Orpet's enquiry whether any one has tested the hardiness of *Heuchera sanguinea*, Mr. J. N. Gerard writes that he tried several young plants last winter in his garden, at Elizabeth, New Jersey, and all perished. It is perfectly hardy in England, and the horticultural papers there all speak of its abundant bloom this year. Mr. C. G. Pringle notes the fact (GARDEN & FOREST, i., 153) that along the northern limit of its distribution this plant is exposed to many degrees of frost.

According to an ancient superstition the Beech is never struck by lightning; and so general has been this belief that a gentleman recently thought it worth while to write to an English journal that he had been told of a lightning-shattered Beech in Ireland. Beliefs of this sort are rarely without some degree of justification in fact, and it would be interesting to know whether in this country the Beech has been observed to possess any greater immunity from electrical dangers than trees of other sorts.

A recent number of *Le Jardin*, a French horticultural paper, contained some curious pictures of large human figures, rudely carved out of Tree-fern stems by the natives of the New Hebrides. They are similar in type to the grotesque colossal figures carved in stone by the Easter Islanders, which have long been familiar to all students of barbaric art. In the museum connected with the Messrs. Veitchs' great horticultural establishment in Chelsea there have been for some years past a series of vases carved from Tree-fern stems; but figures in the same material are a greater novelty.

Recent trade-reports explain that the cultivation of Tobacco has been largely introduced of late years in Borneo, and that large profits are already realized from a special kind that is known as "wrap" Tobacco, and is used for the external coverings of cigars. The production of this article in the East Indies has hitherto been entirely in the hands of the Dutch; but as it is so profitable that dividends of 100 per cent. have not been uncommon, while one company has paid as much as 152 per cent., it is not strange that English colonists should now have taken it up.

An International Horticultural Congress will be held on the 19th, 20th and 21st of August in connection with the Paris Exhibition. The main subjects which will be discussed are the following: 1. Is it possible to obtain, designedly, by artificial fertilization, certain wished-for characteristics in plants cultivated for market purposes, or in floriculture generally? 2. Is it needful, in order to obtain flowers with striped corollas, that flowers with white corollas should first be obtained? 3. Consideration of rates on railroads. 4. Revision of the Phylloxera Convention of Berne. 5. The use of chemical manures in horticulture. 6. Methods to destroy the enemies of cultivated plants (fungi, insects, etc.).

The *Gardeners' Chronicle* says that the Ginkgo is proving itself one of the best trees for street-planting in smoky cities, thriving in the most impure atmospheres and having as yet been attacked by no insect or fungus disease. In this country, so far as we have learned, no extensive use has been made of the Ginkgo as a street tree except in Washington, where of course it is not subjected to the test of an atmosphere impregnated with smoke. If it is, indeed, able to withstand the most unfavorable conditions it might be more generally adopted for it grows rapidly, its shape well adapts it for association with architectural forms, and the peculiar character of its foliage always makes it interesting to the popular eye.

The true eating Banana, or "Madura" is said to be unknown in northern countries, the varieties we import being simply those which are used in the land of their growth for cooking purposes. Many varieties of the Madura are recognized, each of which is distinct in flavor; the smaller are the more delicious and the smallest of all, the so-called "Lady-finger Banana" with a skin hardly thicker than paper, is the most highly prized. Green cooking-bananas are peeled and roasted in the ashes and eaten with butter; partially ripe ones are boiled for a few minutes with the skin on and eaten with syrup or honey; and ripe ones are sliced lengthwise and fried in Olive-oil or butter.

Mr. J. M. White, who owns a Peach-orchard of several hundred trees near New Brunswick, New Jersey, reported last week to the experiment station that one of his trees was badly diseased. Professor B. D. Halsted visited the orchard and found the sick tree readily distinguishable from its healthy neighbors. There were three main branches to the top, and the smallest of them had nearly every leaf badly distorted by "leaf-curl" (*exoascus deformans*). The whole branch was, of course, cut away and the leaves disposed of, leaving the remainder of the foliage of the tree in apparent health. After prolonged search no other tree was found in the whole orchard with a single leaf exhibiting any signs of disease. This is certainly a striking instance of an isolated case of a conspicuous and widespread fungus disease, and it naturally suggests the unanswered question how the "curl" first obtained a foothold in the orchard.

The gold medal of the Linnæan Society of London has been awarded this year to M. Alphonse De Candolle, of Geneva, in recognition of his important services to botany. This medal, having on the obverse a portrait bust of Linnæus, and on the reverse the arms of the Society, was established last year to commemorate the centennial anniversary of the founding of the Society, and is to be bestowed alternately upon a botanist and a zoölogist for distinguished service to biological science, although Sir Richard Owen and Sir Joseph Hooker both received it the first year. An interesting feature of the ceremony the other day was the presence of a young grandson of De Candolle to receive the gift made to the grandfather—a future botanist, it is to be hoped, and the worthy successor in the direct line of distinguished men who for a century have made the name of De Candolle illustrious by their lives and by their service in increasing the knowledge of plants.

According to a correspondent of the New York *Evening Post*, 3,200,000 bushels of Peanuts are consumed in this country every year. They come chiefly from Virginia and North Carolina, although Tennessee also produces a small crop. "Peanuts are planted at corn-planting time; each kernel produces a running vine, like crab grass, and each root produces about twenty pods. When ripe, the plough is run through the loamy soil, on a dry day, just before frost. The nuts are dried and shocked up like corn to keep dry before housing. When marketed, they go to a cleaner, where they are put through steam-power machines and polished, after which they are graded according to size and variety. This year there is but two-thirds of a crop, and they are higher in price than since 1884. The crop begins to come into the market about the first of September. The Virginia nut is the largest and finest. The Wilmington is a smaller sort, and the Spanish nut, a still smaller variety, is one whose kernels peel perfectly clean, thus making it valuable for confectionery."

It will be new to some Americans, even though they know that Peaches are commonly cultivated under glass in England, to be told that Cherries are also grown in this manner. A correspondent of the *Gardeners' Chronicle* recently described the Cherry-house at Gunnersbury Park, where many different varieties afford fruit at different times during the season. "When the trees are started into growth," he says, "a temperature of 45° by day and 40° by night is maintained. When they are in flower plenty of air is given, and the bees are encouraged to work among the blossoms as much as possible. Scarcely any fire-heat is employed; indeed it had been employed only once or twice in order to keep out frost. At the time of flowering plenty of ventilation is given top and bottom. As soon as the fruit has set, the house is closed up somewhat, and the temperature kept quite cool until the stoning process is over, then it is kept a little closer, as when the fruit has stoned it ripens quickly. It is a little difficult to thin out the fruit previous to the stoning stage, as it is uncertain which fruit will mature and which fail. A good watering is given to the trees before they get into flower, and then water is applied with moderation until the fruit has set. Cherries appear to do best, and set their fruit more freely when somewhat dry at the roots, whether the trees are planted out or in pots, and it appears to be quite certain that all flower more freely when worked on the Mahaleb than when on the Cherry stock."